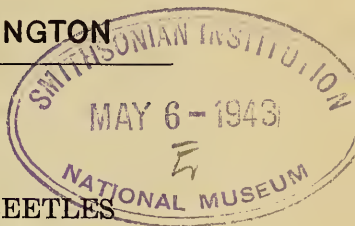


PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



EIGHT NEW MEXICAN SCARAB BEETLES
COLLECTED BY THE HOOGSTRAAL
EXPEDITIONS.

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I am much indebted to Harry Hoogstraal of the University of Illinois for the privilege of examining and describing the present material. The insects of this group are very abundant in neotropical regions and it appears that but a small percentage of the species have been described, and many of the latter are known only from one sex.

Phyllophaga (Phytalus) hoogstraali, new species.

Male: Oblong-ovate, wider behind. Color piceo-rufous and strongly pruinose dorsally; superficially glabrous above except for a few short and erect frontal hairs, though in reality the thorax and elytra with extremely minute hairs. Clypeus moderately long, the apex slightly reflexed and the middle slightly and narrowly emarginate, the angles broadly rounded; disc with dense, regularly-placed, non-contiguous punctures of moderate size. Front punctured as clypeus though the punctures are somewhat contiguous and larger bordering the eyes; fronto-clypeal suture strongly biarcuate. Antenna 10-segmented, rufous, segments 3-5 short; club subequal to funicle. Thorax strongly transverse, the sides evenly arcuately dilated and coarsely crenate and ciliate, the angles noticeable but obtuse; base completely margined though weakly so at middle; disc densely and regularly umbilicately punctate, the moderately-sized punctures separated by once to twice their diameters, a small and irregular median discal area impunctate. Scutellum densely punctured. Elytra punctured as thorax but more sparsely so; sutural and one discal striae obvious, the latter strongly widened apically. Pygidium convex, and somewhat narrowly apically, the apical and ciliate margin thickened and subtruncate; disc polished, densely and regularly punctate and with suberect hairs. Abdomen flattened at middle and polished, pruinose laterally; 5th segment large, plane, and sparsely and setigerously punctate 6th segment half length of fifth, densely and not coarsely punctate,

slightly convex basally and with a narrow transverse sulcus bordering the ciliate apical margin. Hind tibia with one spur fixed, curved, very short and nearly as wide as long; the free spur is nearly three times longer, flattened and suddenly narrowed apically beyond the middle. First segment hind tarsus slightly shorter than second. Claws very narrowly and deeply cleft, and the two parts of nearly equal length and width, the lower tooth at times a little broader; base hardly dilated. First segment of front tarsus elongate, with a short, acute tooth at the inner apex; second segment with a large, broad, flattened, bluntly obtuse and slightly curved lobe on the inner apex; third and fourth segments with a very short, inner, apical spine. Upper face of the front tibia rather densely punctured.

Female: Similar to male except as follows: Hair on elytra a little more obvious. Antennal club equal to segments 3-7 in length. First, third and fourth front tarsal segments with a faint inner apical spine; second segment with a rather obvious inner spine which is shorter and much more narrow than in male. Pygidium more convex and the abdomen likewise, the 6th sternite a little more convex. Hind spurs free, flattened and broad. Length 17-20 mm. Width 9.5 mm-11 mm.

The Holotype male, Allotype female and three paratype males, all in the Saylor Collection are from: "West of Apatzingan 3 miles, Michoacan, Mexico, August 13-15, 1941, 1,200 ft. elev., collected at light by Hoogstraal & Haag."

This species resembles *P. pruinosa* Blanchard except that, externally, the dorsal puncturation is different and the front tarsal projection is lacking in the latter; also, the male genitalia are very near those of *pruinosa* in most characters but in lateral view are less curved. From *P. tegebara* Saylor, *hoogstraali* may be separated by the much shorter fixed spur of the hind tibia. Named for my good friend Harry Hoogstraal, who by his careful collecting is doing much to make this difficult group of insects better known to science.

Phyllophaga (Phytalus) minutissima, new species.

Male. Elongate, very small; color rufocastaneous; shining; entire dorsal surface with very short, erect hair of uniform length. Clypeus very short and transverse, the apex reflexed and narrowly and distinctly emarginate at middle, the angles broadly rounded; disc with coarse, sparse and regularly placed punctures. Front with dense, coarse, variolate punctures. Eyes very large (width of each eye equal to about four-tenths the distance between the eyes). Antenna testaceous, unicolorous, and 9-segmented; segments 3-5 successively longer but each subglobose 6th minute; club subequal to funicle. Thorax transverse, sides roundly evenly dilated at middle, the margins entire and with fine short cilia, the angles obtusely rounded; basal and apical margins both faintly bisinuate; disc with coarse, dense, regular punctures separated by once or more their diameters, though somewhat closer at sides. Scutellum with a few coarse punctures over the entire surface. Elytron with very dense,

somewhat coarse punctures, the surface rugose and the striae obvious. Pygidium dull, faintly convex, the disc extremely densely and coarsely punctate and with short erect hairs; the apex narrowed and subrounded. Abdomen widely flattened, and sparsely, finely, setigerously punctate; 5th sternite densely punctured over nearly its entire surface; 6th two-thirds the length of fifth and densely setigerously punctured. First segment hind tarsus much shorter than second; spurs free, graceful and nearly subequal in length. Claws narrowly cleft, the upper tooth slightly shorter and a very little wider than the apical; base slightly dilated. Length 6.7 mm. Width 3.3 mm.

The unique male Holotype in the Saylor Collection is from: "Pedregal, near Tancitaro, Michoacan, Mexico, swept from flowers, 6,000 feet elevation, June 27, 1941, Traub Collector." This species is near *P. poculifer* Bates, but has 9-segmented rather than 8-segmented antennae and the head and thorax do not have long hair. From *P. temascaltepeca* Saylor, the new species differs in the smaller and more elongate size, and the allied but quite different type of male genitalia.

Phyllophaga (Phytalus) tancitara, new species.

Male: Oblong-ovate; shining above, and disc of thorax and elytra apparently glabrous. Color testaceo-piceous, the elytra usually testaceous and the thorax usually irregularly castaneous with wide lateral testaceous area; the color varies to nearly entirely castaneous in the female and the male elytra are at times castaneous. Clypeus of moderate length and deeply concave, the apex reflexed, slightly rounded, highest at middle and not emarginate, the angles narrowly rounded; disc coarsely and rugosely punctate. Front flat and very coarsely and densely punctate, with long erect pile; vertex impunctate. Antenna 9-segmented, at times 8-segmented; color testaceo-castaneous, the club darker; segments 3 and 4 very long, about 3 times the length of the 2nd, or even longer, the 5th (or 6th) very short and transverse; club long and graceful subequal to length of the entire stem. Thorax dilated in front of the middle, sides straight and nearly parallel, crenate, and with long cilia, the angles obtuse; front margin with a row of very long cilia; disc irregularly punctured with sparse and fine punctures, these separated by one to three times their diameters at the middle disc and more sparse at the sides. Scutellum with several small punctures at the sides. Elytra finely and very rugosely punctured, sutural stria flat and weakly indicated. Pygidium polished and convex, finely and regularly punctate, the punctures with short suberect hairs and separated by two to three times their diameters. Abdomen polished, flattened, very sparsely and finely setigerously punctate at middle, the 5th segment plane and a little more densely punctured medially; 6th segment two-thirds the length of the 5th and a little more coarsely punctured than the latter. Front tibia with the third (upper) tooth weak but obvious. Claws cleft, the lower tooth much shorter than, and somewhat wider than, the long and slender apical tooth; the base is slightly dilated. Hind tibial spurs free and graceful; first segment hind tarsus slightly shorter than the second.

Genitalia exactly as in *platti* Saylor; the male genitalia are also very similar to those of *B. aegrotata* Bates but differ as follows: they are less rounded above in lateral view, and in enface view the apices of the lateral lobes are more strongly convergent, rather than subparallel.

Female: Similar to male except as follows: the color is more unicolorous castaneous; the clypeus is shorter and much less concave and less reflexed; the front is more sparsely punctured; the pygidium is more narrowed apically and is strongly, transversely tumid in the basal third; the abdomen is more convex; the antenna is usually 9-segmented, and segments 3-5 are elongate but only once to twice the length of the second, and the club is equal in length to segments 3-6 of the funicle; and the claw is very widely cleft (and in fact is practically a *Phyllophaga* sensu str. type of claw). Length 9.2 mm. to 12 mm. Width 4.5 mm-5.3 mm.

The Holotype male, Allotype female, and 10 paratypes in the Saylor Collection, are from "Cerro Tancitaro, Michoacan, Mexico, 7800-10,500 ft. elevation, at light or in cloud forest, July 3-18, 1941, Hoogstraal collector" and "Pedregal near Tancitaro, June 24 to July 2, elev. 6,000 ft. Hoogstraal collector." An additional male (which I leave without type designation, and collected from the last mentioned locality) is entirely rufotestaceous and differs also in the smaller and more densely punctate pygidium, which is also transversely impressed along the basal margin.

This interesting new species belongs in the difficult *aegrotata* Bates group, but differs from that species in the slightly different genital characters and the much shorter antennal club, as well as the pilose pygidium. *P. tancitara* resembles *platti* Saylor in the form of the male genitalia but the thorax is less densely punctate, the disc is not pilose, and the clypeal form is different. The number of segments in the antenna varies from 8 to 20 (9-segmented antennae occurred in 4 males, and 8 in two males, and two individuals possessed 8-segmented antennae on one side and 9 on the other). All females have 9-segmented antennae.

Phyllophaga (*Listrochelus*) *cavatus michoacana*, new subspecies

Male: Oblong-oval, strongly shining, color piceo-rugous, the head and legs more rufous, apparently glabrous above. Clypeus moderately long and reflexed, the apex subtruncate and the angles rounded; disc with fine, dense punctures over the entire surface. Front flat, the punctures small and variolate, dense and contiguous above and sparser near clypeal suture; vertex with a very obtuse, transverse elevation which is not at all carinate. Antenna rufotestaceous, 10-segmented; club pale and subequal to entire stem. Thorax with angles obtusely rounded, sides ciliate and subcrenate; disc with somewhat coarse, rather regularly-placed and dense punctures, each separated by once to twice their diameters. Elytron finely and very rugosely punctate, with very minute hairs, the striae obvious. Pygidium very convex, pruinose at base and polished apically; disc with fine and very sparse punctures; the narrowed apex subexplanate and subtruncate. Abdomen flattened, punctures very fine and moderately dense and with short recumbent pile; sides

pruinose; 5th segment flat and hardly punctate at base, transversely impressed apically and apical fourth with a distinct median longitudinal sulcus; 6th sternite very short, with a median longitudinal sulcus, the apical margin ciliate. All claws pectinate or subpectinate along a single margin, without intercalated large teeth. Genitalia symmetrical, in enface view the lateral lobes widely separated at apex, and the apex of each lobe broad though acute.

Female: Antennal club slightly shorter than funicle. Pygidium hardly convex, the base pruinose and the apex polished, with very sparse and fine punctures; apical margin explanate, faintly bidentate and with dense, short cilia. Abdomen polished at middle and very sparsely and finely punctate; 5th segment sparsely punctate at middle, pruinose at sides; 6th segment two-thirds the length of 5th, very coarsely and rugosely punctate, with a faint median longitudinal sulcus, and a moderate median emargination of the densely ciliate apex. Claws with a short median tooth, the surface basad of tooth crenulate. Otherwise as in the male. Length 13–15 mm. Width 7–8.5 mm.

The Holotype male and Allotype female, in the Saylor Collection, are from: "Cerro Tancitaro, Michoacan, Mexico, open pine forest at 10,500 feet elevation (female) and 11,500 feet (male), July 18, 1941, Hoogstraal collector." This subspecies differs from the typical form in the longer antennal club, slightly larger size, thoracic punctuation and male genital characters.

Phyllophaga (Phyllophaga) certanca, new species.

Male: Oblong oval, rufocastaneous and shining; hairy above, the elytra sparsely so. Clypeus moderately elongate, the apex subtruncate and faintly emarginate at middle, the angles very broadly rounded; disc evenly tumid (really convex) in basal part, the punctures coarse, very dense and contiguous, and with long erect hairs. Antenna 10-segmented, unicolorous rufous, the segments 3–5 small and globular, 6 and 7 slightly transverse, and the club small but nearly equal in length to the funicle. Thorax broad, the sides strongly and roundly dilated in front of the middle, the lateral margins ciliate, nearly straight, and at most minutely crenate; the fore and hind angles are very obtusely rounded; base not margined at middle; disc with coarse and moderately dense, rather regularly placed punctures, the latter separated by about once or twice their diameters and the entire disc with long and erect brownish pile; the discal punctures along the frontal margin are slightly smaller and a little denser. Scutellum smooth, with a few fine punctures at sides. Elytra finely, not densely, and somewhat rugosely punctured, the striae including the sutural obvious but not well developed; discal surface with sparse, short erect hairs. Pygidium moderately convex and highly polished; disc very finely and sparsely punctured, with short suberect apex ciliate and broadly rounded. Abdomen polished, flattened, finely and sparsely setigerously punctate, segments 2–4 very faintly and shallowly concave at middle; 5th gradually declivous in apical three-fourths, apical fourth widely and transversely impressed along the margin; the

center of the 5th with several small setigerous punctures and the sides of the segment with a moderately long transverse carina placed midway between the front and the hind margins of the sternite; 6th segment as long as the 5th, strongly flattened, the middle apex faintly and narrowly emarginate, and the basal margin somewhat carinate each side of the middle; disc of 6th with a few sparse tubercles and long erect hairs. First segment of hind tarsus slightly shorter than second; spurs free and graceful. Outer parts of the upper face of anterior tibia finely and densely punctate. Claws with a short submedian tooth strongly inclined basally and nearly touching the strong subquadrangular basal dilation. Hind femur with fine and dense suberect hair. Genitalia bilaterally symmetrical, with the ends of the lateral lobes free though touching; the genitalia are exactly the same shape as those of *plairi* Saylor except that in lateral view the lower half of the lateral lobe in *certanca* is less broadened. Length 13–15 mm. Width 7–8 mm.

Holotype male and 2 paratype males are from "Cerro Tancitaro, Michoacan, Mexico, 7,800 and 8,000 feet elevation, July 3–8, 1941, attracted to light, collected by Hoogstraal," and are in the Saylor Collection.

This species is nearest *plairi* Saylor but may be separated by the hairy thorax, sparsely punctate abdomen, basally-inclined median claw and the genital characters.

***Phyllophaga (Phyllophaga) haagi*, new species.**

Male: Small, oblong ovate and wider behind. Castaneous, somewhat shining and pilose above. Clypeus short and transverse, the subtruncate apex widely and moderately deeply emarginate, the margins faintly reflexed at middle and somewhat more obviously so at the narrowly rounded angles; disc coarsely, densely and setigeously punctate. Front flat, disc coarsely and densely punctured, the punctures shallow and each one rather evanescent posteriorly and bearing a moderately long and erect hair. Antenna nearly unicolorous castaneous, 10-segmented, the segments 3–6 of approximate size and rather short; club slightly darker and subequal to, or very faintly longer than, the entire stem. Thorax dilated at middle, the margins crenate and ciliate, the front angles nearly rectangular but not produced, and the hind angles sharp and rectangular; disc very densely and coarsely punctured, the umbilicate punctures nearly contiguous except on extreme sides and mid-center area of disc, and each puncture with a very long and erect brownish hair. Scutellum impunctate. Elytra extremely finely and very densely and rugosely punctate, the punctures hardly obvious due to the fine rugosity; disc densely covered with short subprocumbent hairs, and with some very long and erect hairs in basal scutellar regions; sutural costa entirely obsolete in apical fourth. Pygidium convex and polished, the subrounded apex slightly explanate and ciliate; disc with very fine and dense punctures separated by 2–3 times their diameter and with short suberect hairs, the discal area in apical fourth impunctate. Abdomen slightly flattened at middle and with very dense and quite fine punctures

and short, procumbent pile; 5th segment noticeably and transverse convex in apical half and the puncturation and pile same as on preceding sternites but slightly more dense; 6th sternite faintly longer than 5th, transversely flattened, the disc minutely and somewhat densely granulate, with sparse, short erect hairs, and a shallow median longitudinal sulcus. Hind spurs free and graceful; first two segments hind tarsus subequal in length. Claws dissimilar: those of fore and mid legs seemingly tridentate due to the long, acutely-dilated claw base, the middle claw slightly wider than, and as long as, the slender apical tooth; all three teeth are separated from each other by very narrow clefts; claws of hind legs cleft but apparently bidentate, since the base is very obtusely and roundly dilated and not extended to form a third tooth. Genitalia somewhat similar to those of *P. heteronycha* Bates but the lateral lobes are much thicker basally and in side view are abruptly reflexed towards their base, rather than evenly rounded. Length 12.-13. mm. Width 6-7 mm.

The Holotype male and paratype male in the Saylor collection are from: "Tancitaro, Michoacan, Mexico, altitude 6,000 feet, collected at light by R. Haag June 30, 1941, and by H. Hoogstraal July 16, 1941." This distinct species resembles *heteronycha* but the dorsal sculpturing and male genital characters will readily separate them.

Phyllophaga (Phyllophaga) tridilonycha, new species.

Male: Similar in all characters to *P. haagi* Saylor except as follows: Middle of clypeus very faintly emarginate and subtruncate. Antennal club barely equal to stem in length. Abdomen with slightly denser procumbent pile; 5th segment with a moderate convexity starting at each side of middle base and running very obliquely apically, the disc with fine, dense, and transverse granules; 6th sternite as long as 5th and with a very distinct median longitudinal sulcus, the entire disc with dense, fine granules and very short erect hairs. All claws seemingly tridentate due to the long tooth-like basal dilation and the claws on all the legs similar in shape. Genitalia slender as in *heteronycha* Bates but the lateral lobes when viewed laterally slightly wider basally.

Female: Similar to male except: Clypeus shorter and angles more broadly rounded. Thorax more sparsely punctured. Elytral hairs longer. Antennal club subequal to segments 3 to 7 in length. Pygidium small, the apex much narrowed, and the disc tumid just before the apex. Abdomen with 5th abdominal plane; 6th slightly shorter than 5th much narrowed and quite rounded apically, and very sparsely punctate. Fore and middle claws as in male, the hind claws however bidentate (i. e. narrowly cleft) due to the small, obtuse and not-prolonged claw base. Length 12.-13 mm. Width 6.5 mm.-7 mm.

The Holotype male and Allotype female in the Saylor Collection are from "Real de Arriba, near Temascaltepec, Mexico, collected by Howard E. Hinton." This species, which belongs in the *P. heteronycha* Bates group (which among other things possesses dissimilar male claws) was compared with the type of *baroni* Bates in the British Museum through

the kindness of Mr. G. Arrow. *P. tridilonycha* is closest to *tridens* Bates (known only from the female) from Oaxaca, but differs as follows: claws of fore and hind feet are dissimilar; the female clypeal apex is less reflexed and only feebly sinuate if at all, and the thoracic angles are distinctly rectangular. While not collected by the Hoogstraal expedition, the present species is so closely allied to *haagi* that it is best included here.

***Onthophagus hoogstraali*, new species.**

Male: Color testaceo-rufous above, slightly shining, the head and prothoracic foveation black; legs rufous, underside of body piceous. Head nearly flat, polished, sparsely and very minutely punctate, the vertex with a sharp, moderately-long, perpendicular tooth midway between the small eyes. Clypeus with apex truncate and the margin reflexed backwards into a very large T-shaped lobe which is truncate apically and nearly twice as broad at apex as at base, and which reaches backwards nearly to the front margin of the eyes; the front or upper surface of the lobe is very finely but obviously punctate. The genae are acute and explanately produced laterally and in front of the eyes, and are but slightly reflexed upwardly. Thorax moderately rounded at sides, the front angles blunt but subrectangular, the hind angles broadly rounded and hardly obvious; the disc slightly in front of the middle is declivous apically and at each side of the middle very strongly raised into an obtuse lobe, the U-shaped declivity between these lobes polished, smooth and minutely punctate; the remainder of the thoracic disc is variolately punctured and with short erect setae, the punctures being coarse but sparsely placed on the disc, and base, but becoming noticeably smaller at the extreme sides and near the front angles. Elytra minutely reticulate and the striae strong, and coarsely punctured; intervals flat, with two irregular rows of punctures each bearing a short blunt seta; each elytron has 6 complete striae (including the sutural) between the suture and the humeral angle, and a seventh incomplete stria which attains the humeral angle. Pygidium minutely reticulate and not obviously punctured, and with sparse, short erect setae. Metasternum finely and sparsely punctate, with short hair. Front tibia 4-dentate, the spur strong and slightly curved. First segment hind tarsus very nearly equal in length to the following 4 combined, the spur subequal in length to the first tarsal segment. Length 10.5 mm. Width 6 mm.

The unique male Holotype in the Saylor Collection is from "Pedregal near Tancitaro, Michoacan, Mexico, 6,000 feet, June 23, 1941, collected by H. Hoogstraal, under moss at the base of an oak tree." From the habitat it may be that this is one of the fungus-feeding group. This beautiful species runs to *O. dicranus* Bates (from Panama) in Boucomont's "Group 3," but the clypeal horn is much wider and is not bifurcate, and the thorax has a deep depression at the middle rather than two subdentate tubercles, and also the size is nearly 5 mm. larger in *hoogstraali*.